V I B G Y O R H I G H

First Preliminary Examination

AY 2020-2021

BIOLOGY

SCIENCE PAPER 3

Grade: X **Max. Marks: 80**

Date : 02/12/2020 **Time Allowed: 2 hours**

Answers to this paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this paper is the time allowed for writing the answers.

---

*Attempt **all** questions from **Section I** and any **four** questions from **Section II.***

The intended marks for the questions or parts of questions are given alongside the questions in [ ].

This question paper contains 11 printed pages.

Section – I (40 Marks)

(Attempt all questions from this section)

Q.1 a) Name the following: **[5]**

i The plant having sunken stomata.

ii The process of synthesis of ATP from ADP and inorganic phospate in the presence of light.

iii Increased production of urine.

iv The part of the brain that carries impulses from one hemisphere of cerebellum to the other.

v The endocrine cells present in the pancreas.

b) Choose the correct answer from the four options given below: **[5]**

i. Leaf is boiled in methylated spirit to _____.

A. Remove starch

B. Remove chlorophyll

C. Kill cells

D. All of these

ii Synthesis phase of cell cycle is called so, because of synthesis of more

A. RNA

B. RNA & Protein

C.DNA

D. Glucose

iii The dorsal root ganglion of the spinal cord contains cell bodies of:

A. Motor neuron

B. Sensory neuron

C. Intermediate neuron

D. Associate neuron

iv Which of the following is not a tropic hormone:

A.Luteinising hormone

B.Thyroid stimulating hormone

C.Follicle stimulating hormone

D.Oxytocin

v The rate of transpiration will be more if the day is _____

A. Humid and windy

B. Hot, dry and windy

C. Hot and humid

D. None of the above

c) **[5]**

Copy and complete the following paragraph by filling in the blanks from 1 to 5 with appropriate term/terms:
You may use a term only once: xylem, phloem, ascent of sap, osmosis, outwards, inwards, endosmosis, root pressure, transpirational pull, turgid, flaccid.

1)_____ is built up due to cell to cell 2)_____ in the root tissue. As one 3)_____ cell presses the next cell, the force of the flow of water increases 4)_____. When water reaches the 5)_____ vessels, it enters the pores of their thick walls with considerable force.

d) **Give the exact location of each of the following structures:** **[5]**

i Pacemaker
ii PCT
iii Hydathode
iv Pituitary gland
v Eustachian tube

e) **Given below are five groups of terms. In each group, arrange and rewrite the terms in the correct order so as to be in a logical sequence. An example has been done for you.** **[5]**
Example: Implantation, parturition, fertilization, ovulation, gestation
Answer: ovulation, fertilization, Implantation, gestation, parturition

i Fibrin, prothrombin, platelet, thromboplastin, thrombin
ii Afferent arteriole, renal vein, capillary network, glomerulus, efferent arteriole
iii Vitreous humour, cornea, pupil , yellow spot, aqueous humour
iv G1 phase, cytokinesis, G2 phase, karyokinesis, S phase
v Water molecules, oxygen, grana, photons, hydrogen and hydroxyl ions

f) Identify the odd term in each set and name the category to which the remaining three belong: **[5]**

Example: Ovary, Fallopian tube, Ureter, Uterus

Odd term: Ureter

Category: Parts of female reproductive system.

i Semi circular canal, utriculus, cochlea , tympanum

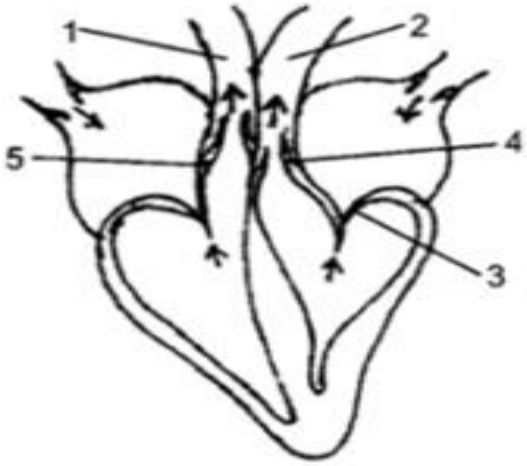
ii Adrenaline, pepsin, thyroxine, insulin

iii Glomerulus, loop of henle, bowman's capsule, neuron, collecting ducts

iv Phosphate, deoxyribose sugar, nitrogenous base, RNA

v Duramater, arachnoid, piamater, pleura

g) The diagram given below represents the human heart in one phase of its functions. Examine it carefully and answer the questions which follow: **[5]**



i Name the phase.

ii Which part of the heart is contracting in this phase? Give a reason to support your answer.

iii What type of blood flows through '2'?

iv State the function of the part numbered '5'

v Label the part numbered '3' and state its function.

h) Match the items given in Column A with the most appropriate ones in Column B and REWRITE the correct matching pairs: **[5]**

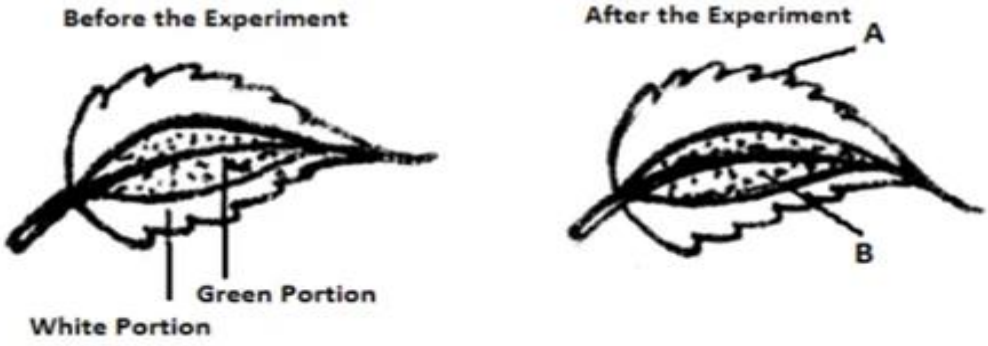
Column A	Column B
a. Diabetes mellitus	1. Hypersecretion of thyroxine
b. Diabetes insipidus	2. Hyposecretion of thyroxine
c. Cretinism	3. Hyperglycemia
d. Insulin shock	4. Hyposecretion of growth hormone
e. Exophthalmic goitre	5. Hypoglycemia
	6. Hypo secretion of ADH
	7. Over secretion of adrenaline

Section – II (40 Marks)

(Attempt any four questions from this section)

Q.2 **[10]**

a) The diagram below represents an experiment to study a certain factor necessary for photosynthesis. Study the same and then answer the questions that follow: **[5]**



i What is the aim of the experiment?

ii Name the test performed on the leaf and the solution used for the test.

iii What type of leaf should be used for this experiment? Give an example.

iv What is the expected result of the experiment on the parts labelled A and B?

v Give a balanced chemical equation to represent the process of photosynthesis.

b) Differentiate between the following pairs on the basis of what is given in brackets **[5]**

i Nucleotide and nucleosome (composition)

ii Transpiration and guttation (definition)

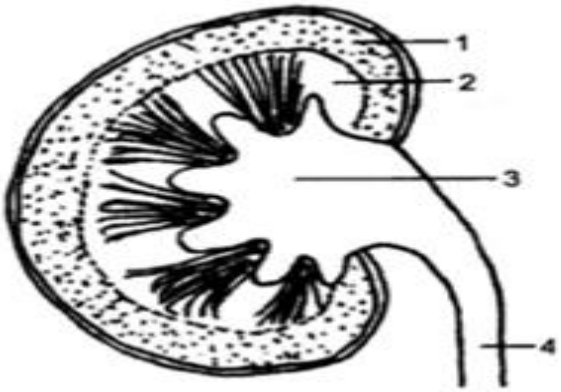
iii Stoma and stroma (describe its structure)

iv Rods and cones (pigment)

v Sympathetic and parasympathetic nervous system (function)

Q.3 **[10]**

a) The diagram given below represents the cross section of human kidney. Study the same and answer the questions that follow: **[5]**



i Label the parts numbered 1, 3 and 4.

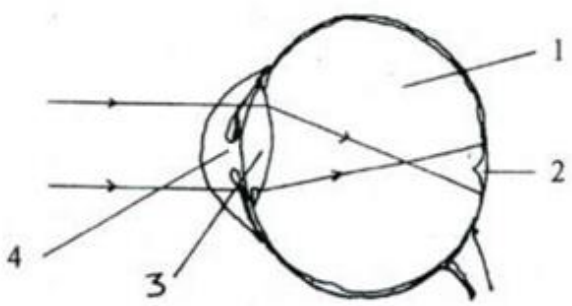
ii Why does part '2' have a striped appearance?

iii What is the fluid that passes down structure numbered '4'? Name the main nitrogenous waste present in it.

iv Mention the structural and functional unit of the kidney.

v Name any two major steps involved in formation of the fluid mentioned in above question (Q.3 a) (iii)).

b) Given below is a diagram depicting a defect in the human eye. Observe carefully and answer the questions that follow: **[5]**



i Name the defect shown in the diagram.

ii State two possible reasons for this defect in human beings.

iii Label the parts numbered 2 and 4.

iv What type of lens is used to rectify the above mentioned defect?
Draw a neat well labelled diagram to show how the above mentioned defect can be rectified using an appropriate lens.

Q.4 **[10]**

a) Give the biological / technical terms for the following: **[5]**

i Inflammation of the meninges.

ii Eye defect where the cornea becomes uneven.

iii The structure that has a sensory organ called 'Organ of corti'.

iv A chemical neurotransmitter stored at the terminal end of the axon.

v A tuft of blood capillaries found in the Bowman's capsule of nephron.

vi The process by which kidneys regulate the water content of the body.

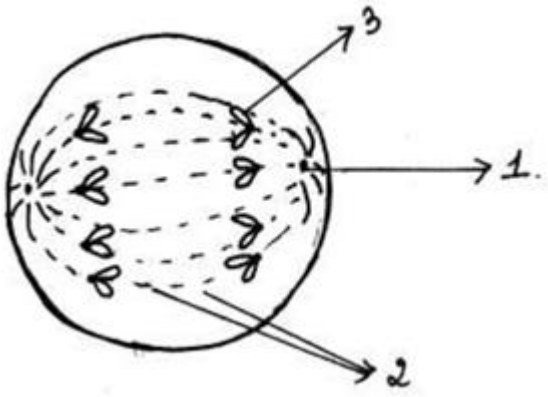
vii Shrinkage of protoplasm when a cell is kept in hypertonic solution.

viii The process in which absorption of water needs metabolic energy.

ix Points at which crossing over takes place between the non-sister chromatids of homologous chromosomes.

x Type of cell division required for formation of gametes.

b) The diagram given below represents a stage in mitotic cell division in an animal cell. Study the same and answer the following questions: **[5]**



i Identify the stage. Give a reason to support your answer.

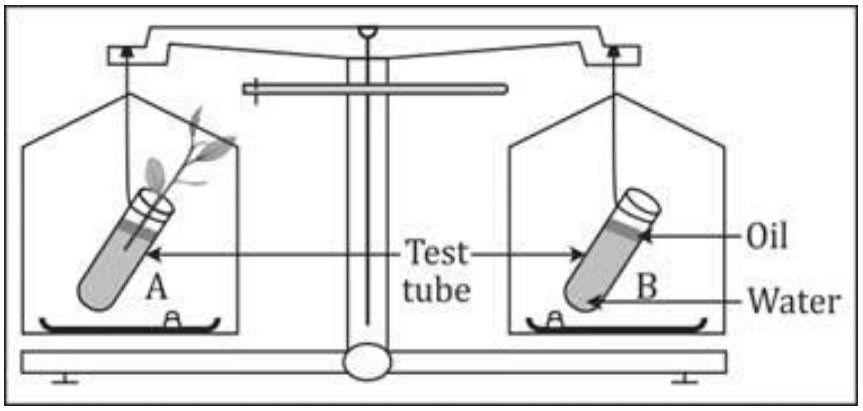
ii Name the parts labeled 1, 2 and 3.

iii What is the chromosome number of the cell shown above?

iv Draw a neat labeled diagram of the cell as it would appear in the next stage. Name the stage.

Q.5 **[10]**

a) Given below is an apparatus used to study a particular process in plants. Study the same and answer the questions that follow. **[5]**



i Name the process intended for study.

ii Define the above mentioned process.

iii What is the purpose of keeping the test tube B in the set up?

iv When the weight of the test tubes A and B is taken before and after experiment, what change would you observe? Justify.

b) Answer the following questions briefly. **[5]**

i Explain why dark reaction of photosynthesis is called biosynthetic phase.

ii Why pituitary gland is called as the master gland of our body?

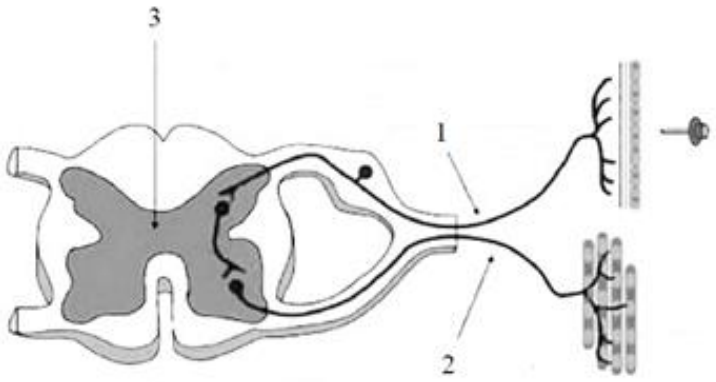
iii Name the parts of the nephron which lies in the renal medulla.

iv What is the function of cerebrospinal fluid?

v Name and state the function of the hormone secreted by the alpha cells of the pancreas.

Q.6 **[10]**

a) The diagram given below shows the internal structure of the spinal cord depicting a certain phenomenon. Study the diagram and answer the questions that follow. **[5]**



i Name the phenomenon that is depicted in the diagram. Define the phenomenon.

ii Give the technical term for the point of contact between two nerve cells.

iii Name the parts numbered 1, 2 and 3.

iv How does the arrangement of neurons in the brain differ from that Of the spinal cord.

v Mention two ways by which the spinal cord is protected in our body.

b) Give scientific reasons for the following statements. **[5]**

i Meiosis is essential in sexually reproducing organisms

ii It is better to transplant seedlings in the flower bed in the evening and not in the morning.

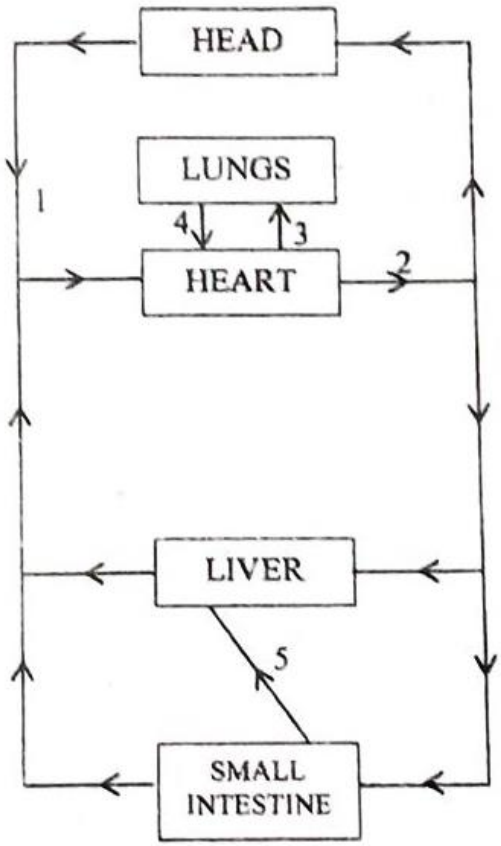
iii Some women have facial hair like beard and moustache.

iv Injury to the medulla oblongata results in death.

v Glucose is absent in the urine of a healthy person.

Q.7 **[10]**

a) **The diagram given below represents the simplified pathway of blood Circulation. Study the same and answer the questions that Follow:** **[5]**



i Name the blood vessels '1' and '2'

ii State the function of the blood vessel 3 and 4.

iii What is the importance of the blood vessel numbered '5'?

iv Name the blood vessel which will contain high amount of glucose and amino acids after a meal.

v State any two structural difference between the blood vessels numbered 1 and 2.

b) **Answer the following:** **[5]**

i Draw a neat diagram of the structure of a root hair and label any two parts.

ii How are root hairs adapted for absorption of water from the soil? Mention any two points.

iii What will happen if excess soluble fertilizer is added to the soil near the root hair?

iv Define: 1. Imbibition

2. Passive transport

*****